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The California Forest and Range Experiment Station is maintained at Berkeley, California, by the Forest Service, U. S. Department of Agriculture, in cooperation with the University of California.

COVER PHOTO:

Split products yard near
Garberville, California

Agriculture--Forest Service, Berkeley, Calif.

OUTPUT OF SPLIT PRODUCTS IN CALIFORNIA, 1956

Richard H. May and Harold L. Baker

In 1956, an estimated 21,433,000 board-feet of fence posts, grape-stakes, fence pickets, roof shakes, and other split products were produced in California, according to a survey by California Forest and Range Experiment Station foresters.

The 1956 output was 27 percent greater than the 16,955,000 board-feet reported cut in 1955.^{1/} But it was only about half as much as production in 1946, when redwood split products alone reached an estimated 40,800,000 board-feet.^{2/}

Redwood is the Major Species

One species, redwood, made up 94 percent of all split products cut in 1956. Incense-cedar, with 5 percent of total production in the State, ranked second. Four other species made up the remaining 1 percent:

Species:	<u>Thousand bd.-ft.*</u>
Redwood	20,136
Incense-cedar	1,093
Juniper	96
Giant sequoia	70
Sugar pine	35
Western redcedar	<u>3</u>
Total	21,433

* Board-feet of product, not log scale.
To obtain cubic feet, divide by 12.

^{1/} California Division of Forestry, Sacramento, 1957.
"Production of California Timber Operators, 1955." 9 pp.
(General split products plus fence-posts at 11 board-feet per post.)

^{2/} Burks, G. F., Vaux, H. J., May, R. H., and Simontacchi, A. 1948. "Commodity Production from Commercial Forest Land in California, 1946." U. S. Forest Serv., Calif. Forest and Range Expt. Sta. Forest Survey Release 6 (Table 19). 38 pp., illus.

Production Concentrated in Humboldt and Mendocino Counties

Major redwood-growing counties ranked highest in split products output in 1956, as they have historically. Humboldt County, with 41 percent of the total output, was first. Humboldt and second-ranked Mendocino County together produced three-fourths of all split products output. Del Norte and Sonoma, close together in third and fourth positions, were well below the two leaders--but considerably ahead of all other producing counties.

Tulare County led production in the Pine Region. Plumas County was second. Production of other counties is given in table 1 (page 6).

<u>Rank</u>	<u>County</u>	<u>Production</u> (Thousand bd.-ft.)
1	Humboldt	8,805
2	Mendocino	7,399
3	Del Norte	1,483
4	Sonoma	1,447
5	San Mateo	677
6	Tulare	313
7	Santa Cruz	243
8	Plumas	232

The Leading Product is Grape-stakes

Grape-stakes, the leading product in volume of production, made up almost half of all split products output in 1956. Ninety-nine percent of the grape-stakes were redwood and the remainder incense-cedar. Fence-posts, second in volume of production, embraced almost one-fourth of total output. About three-fourths of the fence-posts were redwood; most of the remainder were incense-cedar. Paling and pickets ranked third in production, accounting for one-fifth of total cut. Essentially all the paling and pickets came from redwood. In 1956, the volume of paling far exceeded the volume of pickets. These three leading products when taken together accounted for 91 percent of all split products output. Products of lesser volume included predominantly rails and shakes, plus bean-poles, ties, slabs, and miscellaneous.^{3/} Details of production by regions and species are shown in table 2 (page 7).

^{3/} "Boards" for sawed ("Hollywood") shakes are usually made as part of a split product operation. However, the production of shake boards is not included here because the volume of these and shingle bolts will be treated together in a separate publication.

Product:	<u>Thousand bd.-ft.</u>	<u>Thousand pieces</u>
Grape-stakes	10,295	5,579
Fence-posts	4,871	579
Paling and pickets	4,401	5,084
Fence rails	680	216
Shakes	578	998
Slabs	237	22
Bean-poles	100	197
Ties	96	3
Miscellaneous	<u>175</u>	<u>45</u>
Total	21,433	12,723

Various Sizes are Produced

The most common sizes of the split products cut in California in 1956 were as follows:

Grape-stakes.--Grape-stakes, almost entirely a Redwood Region product, ranged in length from 4 to 10 feet, with 6 feet the most common both by volume and number. The few stakes cut in the Pine Region were 6 feet in length. Grapestakes are almost universally 2 x 2 inches in cross section. But a few 1 x 2 and 2 x 3 stakes were also made in 1956.

Fence-posts.--In the Redwood Region, fence-posts ranged in length from 4 to 8 feet. Most of the volume was in 7-foot posts, but the greatest number of posts was in the 4-foot class. In the Pine Region, the posts generally ranged from 6 to 9 feet, although a few 14- and 18-foot posts were reported cut for gate posts. Most of the posts, both by volume and number, were 7 feet long. Most fence-posts (70 percent in the Redwood Region) were split 4 x 5 inches in cross section or 20 inches in top circumference. Other sizes reported were 3 x 4, 4 x 4, 4 x 6, 5 x 5 (both regions); 5 x 6, 5 x 7, 6 x 6, 6 x 7, and 10 x 10 (Pine Region only).

Paling and pickets.--In 1956, paling were cut from 4 to 8 feet in length and split from 1/2 to 1 inch thick and usually 2 inches wide--though some were split as wide as 4 inches. Pickets were generally 6 feet long and 2 x 2 or 2 x 3 inches in cross section. Both paling and pickets were made primarily in the Redwood Region, although a few were split in the Pine Region.

Fence-rails.--In the Redwood Region, rails ranged in length from 4 to 10 feet, with a few even 20 feet. Rails from the Pine Region were 10 feet in length. For rails 10 feet and less in length, cross-sections were commonly 2 x 2, 2 x 3, and 2 x 4 inches. Some 10-foot rails were also split 3 x 3, 3 x 4, and 5 x 5 inches. The 20-foot rails were 4 x 5 inches in cross section.

Split shakes.--Shakes produced in the Redwood Region varied from 2 to 3 feet in length but were mostly 2 feet. Thickness ranged from 1/4 to 1 inch, with 1/4- to 1/2-inch shakes being split edge-grain and those 1/2 to 1 inch split flat-grained and called Monterey shakes. Widths ranged from 6 to 8 inches for 2-foot shakes but were 6 inches only for 2-1/2- and 3-foot shakes. Shakes split in the Pine Region were 2 to 2-1/3 feet long, 1/4 to 3/4 inches thick, and 5 to 8 inches wide.

Slabs.--Slabs, for re-splitting at some place away from the point of origin, were usually 6 feet long, 2 inches thick, and from 7 to 12 inches wide. They were usually made into grape-stakes or paling before reaching the consumer.

Ties.--Split railroad ties were produced only in the Redwood Region. These ties were 6, 7, 8, and 12 feet in length, and 6 x 6, 6 x 8, and 7 x 8 inches in cross section.

Bean-poles.--Bean-poles were 5 to 8 feet long and 1 x 1 inch in cross section. In 1956, they were split only in the Redwood Region.

Miscellaneous.--Included in this category were: cross-arms, cants, posts shorter than 4 feet, patio blocks, and unsegregated products. Vineyard cross-arms were generally 3 feet long and 2 x 2 inches in cross section. Too few of these were split in 1956 to report as a separate category. Cants cut for mantels were 7 feet long and 4 x 12 inches in cross section. Those designed for rustic uses were larger. A number of 3-1/2-foot posts were reported, presumably for use as guard-rails. Patio blocks, although not strictly split products, are included here because they are usually produced and sold with split products

Most Operations are Small

Almost half of the reporting split products operators--the most in any size class--produced only 14 percent of the State's total output. The greatest share--more than 60 percent--came from operators producing 500,000 board-feet or more a year, who made up only 8 percent of the reporting operators:

Production in bd.-ft.:	<u>Reporting operators</u>		<u>Production</u>
	(Number)	(Percent)	(Percent)
1 - 9,999	47	30	1
10,000 - 99,999	76	48	14
100,000 - 499,999	23	14	24
500,000 and over	<u>12</u>	<u>8</u>	<u>61</u>
Total	158	100	100

Redwood Region operators were represented in all classes, but the Pine Region had none in the largest class and only 2 in the next to largest.

Type of operator is closely correlated with size of operation. Operators in the smallest volume class are intermittent or part-time splitters. Splitters working singly, but full-time, usually fall into the volume class of 10,000 to 99,999 board-feet annual production. The next group usually includes operators who work full-time with partners or have helpers.

The largest volume class includes primarily operators with concentration yards along main roads or highways. These operators usually employ several men who work at the yard; they also buy small lots of split products from individual operators. One of the largest operators reported buying from 32 others, (none of whom had been canvassed by the Station) whose aggregate production was less than his own output. In 1956, volumes reported by the largest operators were primarily in the range from 600,000 to 1,200,000 board-feet, with a maximum output of about 2,500,000 board-feet of split products. The number of operators in the largest production class has more than doubled within the past decade, and mechanization has increased in this branch of the timber industry, which was formerly almost wholly hand labor.

Large Proportion of Output Cut from Dead Trees

Operators producing 59 percent of the cubic volume of California split products output in 1956 reported the proportions of live and dead material utilized. Of this volume, a little over half was from live timber and the remainder from dead or salvaged timber. It cannot necessarily be assumed that these proportions were the same for the nonreported volume. Operators may have failed to make an entry for dead volume simply because they had none, not because the item was overlooked. Even so, the 22 percent of known dead volume for redwood split products is a great increase over the 2 percent estimated for 1946.^{4/}

Species:	<u>Reported</u>			<u>Not</u>	
	<u>Live</u>	<u>Dead</u>	<u>Total</u>	<u>reported</u>	<u>Total</u>
	----- (Percent) -----				
Redwood	35	22	57	43	100
Incense-cedar	8	88	96	4	100
Juniper	74	22	96	4	100
Giant sequoia	3	97	100	0	100
Sugar pine	34	40	74	26	100
Western redcedar	<u>0</u>	<u>100</u>	<u>100</u>	<u>0</u>	<u>100</u>
All species	33	26	59	41	100

^{4/} Op. cit., footnote 2, p. 17.

Table 1.- Split products output by region and county,
California, 1956

Region and county	: : Operators :	: :	Output
	<u>Number</u> ^{1/}	<u>Thousand bd. -ft.</u>	<u>Thousand cu. -ft.</u>
<u>Redwood Region</u>			
Humboldt	33	8,805	733.8
Mendocino	37	7,399	616.6
Del Norte	4	1,483	123.6
Sonoma	14	1,447	120.6
San Mateo) <u>2/</u>	13	677	56.4
Santa Cruz) <u>2/</u>		243	20.2
Monterey	3	85	7.1
Region total	104	20,139	1,678.3
<u>Pine Region</u>			
Tulare	10	313	26.1
Plumas	3	232	19.3
Madera	5	156	13.0
Placer	6	153	12.7
Modoc	3	142	11.8
Lassen	4	85	7.1
El Dorado	5	52	4.3
Nevada	7	40	3.3
<u>Fresno-Kern</u>			
San Bernardino ^{3/}	5	43	3.6
Amador-Calaveras-			
Tuolumne ^{3/}	4	29	2.5
Shasta-Siskiyou-			
Tehama ^{3/}	3	25	2.1
Butte-Sierra-			
Yuba ^{3/}	5	24	2.0
Region total	60	1,294	107.8
State total	<u>4/</u> 164	21,433	1,786.1

^{1/} Reported and estimated.

^{2/} Ten operators in Santa Cruz only, 2 in San Mateo only, and 1 in both counties.

^{3/} Combined to avoid disclosure of individual operations.

^{4/} Does not include many small operators who sold to large operators and were not canvassed by the Station.

Table 2.- Split products output by type of product, region, and species,
California, 1956

Region and species	Type of product									
	: : : Paling : : : : Rail-: 2/ :									
	: Grape- : Fence : and : Fence: : 1/ : Bean : road : Miscel-:									
	: stakes : posts :pickets: rails: Shakes: Slabs: poles:ties :laneous: Total									
----- <u>Thousand bd.-ft.</u> -----										
<u>Redwood Region</u>										
Redwood	10,262	3,707	4,393	673	522	230	100	96	153	20,136
Western redcedar	-	3	-	-	-	-	-	-	-	3
Region total	10,262	3,710	4,393	673	522	230	100	96	153	20,139
<u>Pine Region</u>										
Incense-cedar	33	1,035	6	7	5	7	-	-	(N)	1,093
Juniper	-	96	-	-	-	-	-	-	-	96
Giant sequoia	-	30	2	-	16	-	-	-	22	70
Sugar pine	-	-	-	-	35	-	-	-	-	35
Region total	33	1,161	8	7	56	7	-	-	22	1,294
State total	10,295	4,871	4,401	680	578	237	100	96	175	21,433

(N) = Negligible, less than 500 board-feet.

1/ Resplit at yards away from point of origin, primarily into paling and grape-stakes.

2/ Includes cross-arms, cants, posts less than 4 feet long, patio blocks, and unsegregated products.

SURVEY PROCEDURE

A questionnaire was sent to all split product operators registered with the California Division of Forestry for 1956 and to other operators known to National Forest timber sale administrators. Operators not responding to two queries by mail were visited in the field. In the Pine Region all operators of record were visited or an estimate of their production was obtained. In the Redwood Region, most of the non-replying operators were visited, as were unlisted operators discovered during the field work. Estimates for operators not contacted were based on the average output of replying operators from the same general size-class and geographic area.

Operators reported number of pieces and average dimensions per piece. Station foresters converted these data to board-feet and cubic-feet.

ACCURACY

A statistical measure of accuracy is not possible because all producers are not known. This survey may have missed some small producers, but it is unlikely that any medium or large producers were missed because their operations are more easily located. Several large producers reported the aggregate production of many small ones, which would make a statistical measure invalid. However, from follow-up of non-replying operators in the field and from incidental observation of replying operators, the authors believe that the production here estimated is within 10 percent of the true figure that would be obtained if a complete canvass could be made.

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VOLUME PERCENTAGE BY COUNTIES

Legend

- 1 percent of output
- less than 1/2 %

No output reported from counties not named.

